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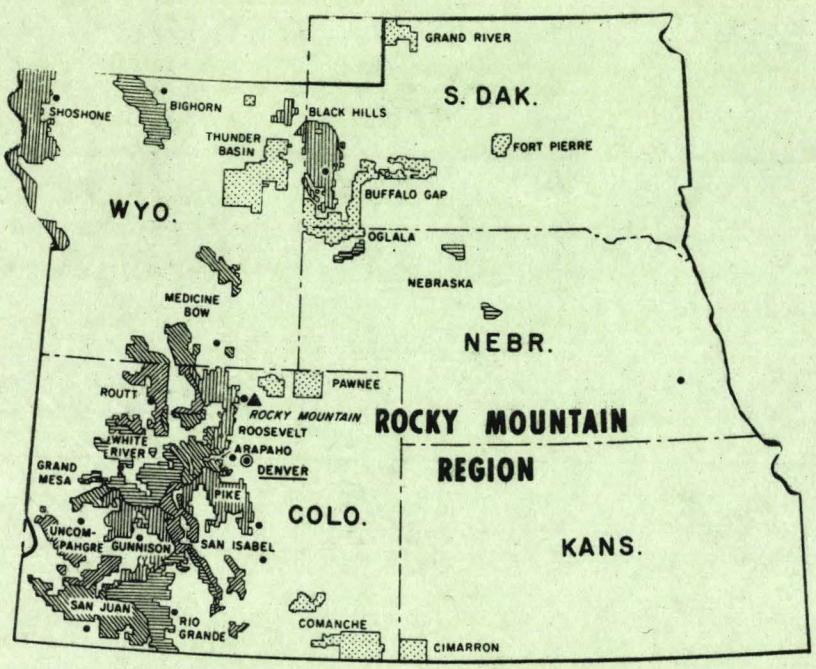
January 1975

BIOLOGICAL EVALUATION

MOUNTAIN PINE BEETLE
Pike-San Isabel and Arapaho-Roosevelt National Forests
(Front Range of Colorado)



U. S. DEPARTMENT OF AGRICULTURE - FOREST SERVICE
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BIOLOGICAL EVALUATION

MOUNTAIN PINE BEETLE
Pike-San Isabel and Arapaho-Roosevelt National Forests
(Front Range of Colorado)

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BIOLOGICAL EVALUATION

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INTRODUCTION

Mountain pine beetle in ponderosa pine stands along the Front Range of Colorado were evaluated by Forest Pest Management personnel during the summer and fall of 1974. While this evaluation was conducted primarily on National Forest lands, the results and recommendations generally apply to all lands within the Front Range. Losses were again found to be at a high level on lands within different ownerships from south of Canon City to southern Wyoming. Mountain home developments in these areas have increased the concern and value of these losses. Chemical suppression should be coordinated with stand improvement programs.

Silvicultural improvements of the Front Range stands must be implemented if the mountain pine beetle problem is to be solved. Beetle losses will continually occur along the Front Range because the beetle is just as much a part of the forest community as the trees. However, these losses can be minimized to tolerable levels with silvicultural practices that enhance both tree vigor and growth.

Guidelines for multipurpose silviculture practices along the Front Range are forthcoming in a report by C. A. Myers, Rocky Mountain Forest and Range Experiment Station. 1/ Myers recommends that dense ponderosa pine stands 60 to 120 years old with a d.b.h. of 6-8 inches or larger should be thinned to a basal area/acre of 80 $ft.^2$ and be maintained at a basal area of less than 140 thereafter. Younger and small diameter stands should also be thinned before reaching an average d.b.h. of 6 inches. Losses are most difficult to prevent in fringe areas, especially where the forest type adjoins grasslands. Direct control and/or salvage may be the only practical method for these areas.

1/ Myers, C. A. Multipurpose silviculture in ponderosa pine stands of the Montane zone of central Colorado. USDA Forest Research Paper (in press). Rocky Mountain Forest and Range Experiment Station, Fort Collins, Colorado.

All land managers should implement these management practices at every opportunity. Private landowners should be encouraged to contact the Colorado State Forest Service for technical assistance in implementing these management guidelines.

RESULTS AND DISCUSSION

Sampling was designed to give only an overview of the population trend for the Front Range and not for specific locations. The brood samples from 332 trees in the 17 locations ranged from static to increasing population trend for the Front Range (Table 1). Buildup ratios from the northern portion of the infestation indicated an increase in the number of 1974-75 infested trees (Table 2). No immediate change in the trend can be expected.

Chemical suppression efforts were conducted within designated control units in 1973 by the Colorado State Forest Service on private lands, and on Federal lands by the Arapaho-Roosevelt National Forest. A Post-Treatment Evaluation is in preparation covering a portion of this area. Chemical suppression has been funded for 1975.

Chemical suppression effects should be coordinated with stand improvement (Stevens, et al., 1974). Chemical suppression alone may extend the inevitable since it doesn't change the beetles environment. Previous chemical suppression efforts for the mountain pine beetle in lodgepole pine and the southern pine beetle have had sporadic and varied results (Amen and Baker, 1972; Lorio and Bennett, 1974). Chemical treatment may disperse beetle populations and encourage continuation of epidemics (Williams, 1971; Williams and Vite, 1971). This stands to reason as stand structure, which is one key factor in bark beetle population dynamics, is not altered by chemical treatment. Without stand structure improvement the losses will continue. One alternative to the Front Range problem would be to make suppression dependent on a stand improvement program. This would not only treat the symptom, but the cause, and increase the cost-benefit.

TABLE 1

RESULTS OF BARK SAMPLEBROOD COUNTS
FROM THE 1973 INFESTED TREES

Area	No. Trees Samples	Avg. Brood/ 0.25 ft.^{2} of Bark	Infestation Trend
Arapaho-Roosevelt National Forest			
Mill Creek	24	16.1	Static-increasing
Prairie Divide	48	14.8	"
Redfeather	11	18.3	"
Rustic	12	11.7	"
Lower Bennett Creek	24	24.3	"
Stove Prairie	14	10.7	"
Buckhorn	24	13.7	"
Big Thompson River	12	13.8	"
North Fork of Big Thompson River	14	9.9	"
Upper Elk Meadows	15	8.5	"
Gross Reservoir	17	18.2	"
Montane Park	7	13.4	"
Pike-San Isabel National Forest			
Bailey Picnic Ground	24	11.6	Static-Increasing
Kelsey Creek	24	12.8	"
Wigwam Creek	14	12.1	"
Trout Creek	24	15.6	"
S. Hardscrabble Creek	24	14.4	"

TABLE 2

BUILDUP RATIOS FOR SELECTED AREAS
ON THE
ARAPAHO-ROOSEVELT NATIONAL FOREST

Area	Acres Cruised	No. Infested Trees 1974	No. Infested Trees 1973	Buildup Ratio
Bull Garden Divide	16	56	13	4.3:1
Bennet Creek	24	65	55	1.2:1
Camman Spring	16	11	32	0.3:1
Piper Meadows	32	73	87	0.8:1
Coffin Top	32	79	53	1.5:1
Bummers Gulch	16	449	169	2.6:1
S. Boulder Creek	13	111	53	2.1:1
Winiger	16	87	176	0.5:1

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